In the second case, the DTN is returned to the originating network and the call is routed based on the DTN which must always be a geographic NANP (routing) number.

Some UPT/PCS Service Providers (PSP) will be carriers and will wish to handle the call to completion, while other PSP's will not have carrier status or capability and therefore will turn the call back to the originating "UPT/PCS Serving Exchange" for completion. In the second scenario the DTN may be preceded by the Carrier Access Code (CAC) chosen by either the PSP or the UPT/PCS user.

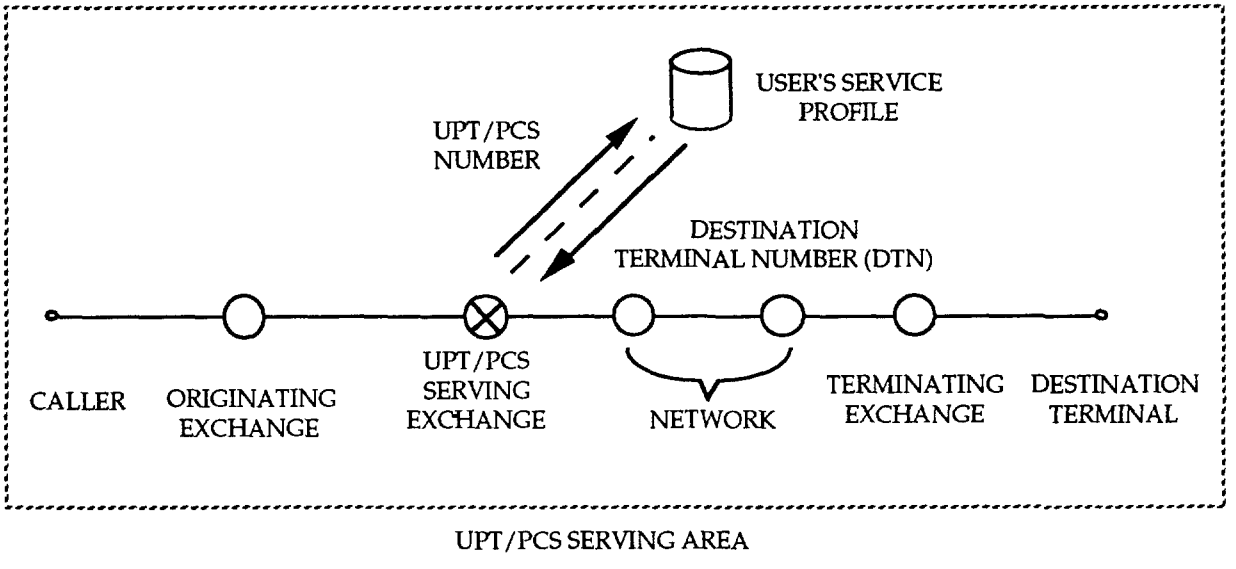


**Figure 2** Country-Based Routing - Incoming Call

# APPENDIX 1

## to TR # _____ - UPT/PCS

## Numbering, Addressing and Routing

## UPT/PCS Numbering Plan Attributes

## 1.0 INTRODUCTION

This appendix contains a description of ten attributes which the North American industry has developed to assist in the selection of UPT/PCS numbering and addressing plans. It provides an evaluation of the Home-based and Country-based numbering schemes against the agreed attributes. Finally, where a numbering scheme falls short of fully meeting an attribute, a discussion is provided.

## 2.0 UPT/PCS NUMBERING/ADDRESSING ATTRIBUTES

The following are attributes and criteria inherent in a UPT/PCS number for the purpose of evaluating and analyzing and addressing scenarios.

### 2.1 Identify a person - not a terminal

This is a fundamental requirement of the UPT/PCS service. It is the identity that allows a person to be located irrespective of location and terminal type. The personal number is the identity that a customer will declare to others so as to be called. The personal number is also the identity that would be listed in a directory against the users name.

### 2.2 Dialable from any terminal on the public switched network

Given that a customer can be identified by a single identity (personal number), it is equally important that it can be universally dialed from any participating network or network type (PSTN, ISDN or potentially PSPDN) terminal. This implies that the UPT/PCS numbering solution is consistent with current dialing/access procedures.

### 2.3 Uniform with existing numbering and dialing plans

- Human Factors
- Network Aspects

As the personal number can be dialed from any participating network terminal it is essential, from the perspective of user knowledge/awareness and network capabilities, that the dialing and numbering plans are at least consistent with the existing structures. The numbering should be the same across all participating networks. The dialing plan however may not be absolutely the same either within or between networks. Care will be necessary in selecting the most economic dialing structures that aim to be as close, if not the same, between all networks.

### 2.4 Adaptable to the long term needs of UPT/PCS

For network operators and administrators it is particularly important that sufficient flexibility is built in the deployment of the numbering plan to allow for growth, development, and infrastructure changes. This is an important lesson that numbering plan administrators have learned and is essential to long term planning and evolution.

### 2.5 May be implemented within the framework of existing network capabilities

It is important that UPT/PCS does not unnecessarily introduce new demands and requirements on numbering and dialing plan structures that cannot be implemented within the framework of existing or planned network capabilities. This is an important factor that should allow the universal aspect of UPT/PCS to be available within a reasonable time frame.

## 2.6 Ability of UPT/PCS number to move with the user (Portability)

Given that UPT/PCS will be supported by many service providers and network operators, it is important to identify the principle that users are not forced to change their number if they wish to change their service providers or supporting base network. This is a difficult requirement to achieve and is often referred to as number portability.

## 2.7 Network efficiency

- Efficient Routing
- Identify UPT/PCS type call with ease
- Conservation of future resource

The numbering and dialing plan structure should, where possible, allow efficient routing. This would imply a structured rather than unstructured form of number. To support this requirement and ease of network design, it is desirable to identify a UPT/PCS call with the minimum number of digits with the numbering and/or dialing plan structure. Finally conservation of future resources is also very important. Numbering plans, by their nature are a finite resource. These resources are constrained also by structures which reduce the actual available capacity. This is a recognized problem with number plan administrators and therefore must be taken into full account.

## 2.8 Easy to administer

Once designed the numbering plan structure should lend itself well to day to day management and administration. Overly complicated administration procedures will have a detrimental effect on the introduction of UPT/PCS service.

## 2.9 Users able to recognize a UPT/PCS number

A user, be it a UPT/PCS subscriber or normal subscriber should ideally be able to universally recognize a UPT/PCS number from a non-UPT/PCS number. This may be achieved by a dialing prefix and/or the numbering plan or a combination of both. Obviously simplicity is essential for presentation.

## 2.10 UPT/PCS Numbering Format

CCITT Recommendation E.164 (in World Zone 1, the NANP), is the numbering structure for UPT/PCS. CCITT (Draft) Recommendation E.168 is the appropriate application of CCITT Recommendation E.164 for UPT/PCS within World Zone 1. Specifically, the UPT/PCS numbering format, within World Zone 1 will not exceed the maximum number of dialed digits allowed by the NANP.

# 3.0 ATTRIBUTE EVALUATION MATRIX

The following matrix provides an evaluation of the Home-based and Country-based numbering schemes relative ability to meet the established attributes. The attributes have been divided into three major functional categories - Service, Network and Numbering Resource.

| Attribute/Category | Home-based | Country-based |
|---|---|---|
| SERVICE | | |
| Identify a Person Not a Terminal | Yes | Yes |
| Users Able to Recognize | (Note 1) | Yes |
| Number Portability | (Note 2) | (Note 2) |
| Dialable from any PSTN Terminal | Yes | Yes |
| Uniform with Existing Plan | Yes | Yes |
| NETWORK | | |
| May be Implemented within the Framework of Existing Network Capabilities | Yes | (Note 3) |
| Interworking with Existing Networks | Yes | Yes |
| Efficient Routing | Note 4 | Yes |
| Identification of Call Type within Number | Note 5 | Yes |
| NUMBERING OF RESOURCE | | |

**Explanation of Notes**

**Note 1** The geographic NPA based numbers assigned under the Home-based scheme will contain no specific UPT/PCS component which can be recognized by callers (or the network) outside the home serving area. Within the home domain callers may be able to recognize the number through familiarity acquired through advertising or frequent use.

**Note 2** Number portability could be achieved within a designated serving area providing there is cooperation between the Service Providers in that serving area. It is unlikely, in the foreseeable future, that a Home-based numbered customer (i.e. a geographic NPA numbered customer) could have access to number portability (i.e. keep the same number) across different geographic serving areas.

In the case of the Country-based plan, number portability across a large but cohesive serving area once again will require full cooperation between all participating Service Providers. Once number portability is achieved, the UPT/PCS number will be assigned to a user and that user will be able to change Service Providers anywhere within the serving area and keep the same UPT/PCS number.

**Note 3** The Country-based scheme involves the establishment of new SAC code(s). While these new SAC's may be implemented within the existing network framework, a process of 'opening' the code(s) in all the appropriate network components must be carried out. Further, the

specific NXX routing requirements must be negotiated and implemented before service can be established.

**Note 4** The Home-based scheme anticipates a restricted geographic service area, and therefore all calls are automatically calls routed to that geographic serving area. Calls completed within the serving area are routed relatively efficiently, however, if the UPT/PCS user is having calls routed to a DTN outside the serving area, significant routing inefficiencies may occur (Ref. Note 5).

**Note 5** From a network perspective the Home-based number scheme only enables UPT/PCS identification within the home serving area. All network components within the home area must be able to recognize the UPT/PCS call to the extent required to route it to the PSP's information database. Calls to the Home-based UPT/PCS number from points outside the home serving area will not be recognized as being UPT/PCS.

**Note 6** The Home-based scheme will use geographic NPA numbers. The current administrative procedures will apply to or be modified to take into account UPT/PCS Home-based numbering.

**Note 7** The Country-based plan is based on UPT/PCS SAC(s). Assignment of resources from these SAC(s) must be centralized. Industry approved UPT/PCS N00 NXX Assignment Guidelines are currently under development (Industry Carriers Compatibility Forum - ICCF). These assignment guidelines will initially deal with the assignment of N00 NXX

codes to identify Service Providers. It is recognized that the advent of UPT/PCS number portability will require new administrative guidelines to account for the assignment of the full 10 digit (SAC NXX XXXX) numbers to UPT/PCS users.

**Note 8** Both the Home-based and Country-based plans are considered to be adaptable to long terms needs as the growth potential of both plans is limited only by the availability of relief NPA's (640 additional NPA's available on 1-1-95).

# COMMITTEE T1 - TELECOMMUNICATIONS
# STANDARDS CONTRIBUTION

**********

STUDY PROJECT: T1P1 Personal Communications

**********

TITLE: Comments on the UPT "Extended NANP" Prefix Plan

**********

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ISSUES ADDRESSED: This contribution highlights certain issues USTA feels should be understood by the industry regarding the adoption of the "Extended NANP" prefix plan as described in T1P1 document T1P1.3/92-115 attachment C generated at the last T1P1 meeting held April 20-24, 1992, in Dallas, Texas.

**********

DATE: July 27, 1992

**********

DISTRIBUTION TO: Working Group T1P1.3

**********

NOTICE

# COMMENTS ON THE UPT "EXTENDED NANP" PREFIX PLAN

## PURPOSE

The purpose of this contribution is to highlight certain issues USTA feels should be understood by the industry regarding the adoption of the "Extended NANP" prefix plan as described in T1P1.2/92-115 att. C generated at the last T1P1 meeting held April 20-24, 1992, in Dallas, Texas.

USTA believes that the "Extended NANP" prefix plan will result in customer confusion, additional unwarranted cost to the industry and the public, unnecessary network architectural changes, as well as being contrary to established agreements reached in T1P1.3 on UPT numbering issues. Adoption of such a plan may benefit a segment of the industry who may easily incorporate technical changes to their equipment, however, the great majority of local exchange carriers will be burdened with unnecessary modifications to their networks.

## THE "EXTENDED NANP" PREFIX PLAN IS NOT AN EXTENSION OF THE NANP

The "Extended NANP" Prefix Plan is misleadingly labeled. It is not an extension of the NANP, but a new numbering plan that looks confusingly similar to the NANP. The proposed dialed "UPT Prefix" is nothing more than an escape code, moving the user from the NANP to a new numbering plan.

T1P1.3 has concluded at past meetings that the NANP should be used for UPT service in WZ1, since the NANP is consistent with E.164 and draft standard E.168. No justification has been documented, either nationally or internationally, that would support the need to create a new numbering plan to accommodate UPT.

## SWITCH MODIFICATIONS REQUIRED

The use of an eleven digit numbering plan domestically will necessitate modifications to existing switching equipment for every exchange wishing to support the "Extended NANP" prefix plan. These changes will also be required to support the fourteen digit dialing requirement of the "Extended NANP" prefix plan. For calls to countries outside of World Zone 1, up to fifteen digits may be required. This will also necessitate switching equipment modifications.

The "Extended NANP" prefix plan will require additional (for the LEC industry) switch logic to recognize the prefix, examine the first 1-3 digits to determine the country code and route the call appropriately. Since the "Extended NANP" prefix plan number starts with a one "1", this could cause a potential problem for telephone switches. The one which forms the first digit of every "Extended NANP" prefix number must be differentiated from the one dialed as part of the normal dialing plan for ten digit NANP calls (which tells the switch that ten digits are to follow). This additional usage of the numeral "1" in this way has the possibility of confusing both users and switching equipment. In addition to the switch modifications that will be required within WZ 1, foreign RPOAs may have to modify their switch operations to accommodate these non-standard numbers being dialed from within their countries.

## SERVICE PROVIDER IDENTIFICATION AND LACK OF NUMBER PORTABILITY

The "Extended NANP" prefix plan will lead to inefficient usage of numbering resources due to the inclusion of service provider identification within the number. Following the country code, the "Extended NANP" prefix plan incorporates a service provider code. This code may be three or more digits in length. The inclusion of such a code within the number will create reserved numbering space for given UPT providers that will not be portable between providers. The public will be forced to change their UPT number if they wish to change service providers, until a nationwide database scheme (ala 800) is implemented. There has been no time frame referenced as to when the "Extended NANP" prefix numbering resources would become part of a nationwide data base access scheme.

If three digits are used for the service provider identification, then 1,000 UPT providers can be supported each having 10 million numbers at their disposal. If four digits are used, then 10,000 providers can be supported and they will have up to 1 million numbers that they can allocate. If each member of USTA were to request a service provider code, then four digits would be required (since there are over 1,000 members).

The Long Range Numbering Plan recently recommended by the NANPA does not support the concept of service provider identification within a numbering plan. USTA has supported that point of view, and feels that service provider identification should not be within the UPT number, rather it should be located in an industry accessible data base look up. USTA also feels that allocating 1-10 million numbers to any particular UPT provider would lead to very inefficient usage of numbering resources.

## HUMAN FACTOR CONSIDERATIONS

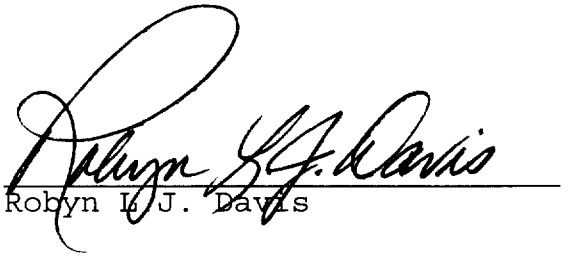
Human factor considerations require serious evaluation with respect to the "Extended NANP" prefix plan. Dialing extra digits to complete UPT calls will take subscribers additional time, increase dialing errors, and demand additional network resources. In addition, the numbers within the "Extended NANP" prefix plan are very similar in format to the NANP. This similarity will no doubt create confusion for subscribers. It will be very difficult to tell the difference between NPA codes and service provider codes, and this is sure to lead to many mis-dialed numbers. In addition, the similarity of NANP and "Extended NANP" numbers means that misapplication of the dialed prefix will result in many misdirected calls. For these reasons, USTA believes that compared to the NANP, the "Extended NANP" prefix plan will contribute to more human factor problems.

## SUMMARY

For the reasons and examples listed above, USTA is not in favor of the industry adopting the "Extended NANP" prefix plan. USTA recommends that T1P1.3 concentrate on accommodating the UPT numbering requirements of the industry through the scenarios outlined in the existing draft of E.168 per the past agreements reached in T1P1.3.

**CERTIFICATE OF SERVICE**

I, Robyn L.J. Davis, do certify that on February 24, 1993 copies of the foregoing Reply Comments of the United States Telephone Association were either hand-delivered, or deposited in the U.S. Mail, first-class, postage prepaid to the persons on the attached service list.



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